WHAT IS CLAIMED IS:

1. An apparatus for plating a noble metal or noble metal alloy on a microelectronic workpiece comprising:

a reactor chamber;

an electroplating solution disposed in the reactor chamber, the electroplating solution containing ions and/or complexes of a noble metal that is to be plated onto the workpiece;

a workpiece support including a contact for providing electroplating power to a surface at a side of the workpiece that is to be plated, the contact contacting the workpiece at a large plurality of discrete contact points about the periphery of the workpiece, the contact points being sealed from exposure to the electroplating solution;

at least one anode spaced from the workpiece support within the reaction chamber and contacting the electroplating solution.

2. An apparatus as claimed in claim 1 wherein the electroplating solution provides ions or complexes of platinum for electroplating the workpiece.

3. An apparatus for plating a noble metal or noble metal alloy on a microelectronic workpiece comprising:

a moveable head including a rotor and rotor drive adapted to rotate the workpiece;

a processing base;

an electroplating solution disposed in the processing base and containing ions or complexes of the noble metal that is to be plated onto the workpiece;

a contact assembly disposed on the rotor of the moveable head, the contact assembly providing electroplating power to a peripheral edge surface of a side of the workpiece that is to be plated, the contact assembly contacting the workpiece at a plurality of discrete contact points, the contact points being isolated from exposure to the electroplating solution;

an actuator disposed to move the moveable head between a loading position in which the workpiece may be placed for support on the rotor and into engagement with the ring contact, and a processing position in which the surface of the workpiece that is to be electroplated is brought into contact with the electroplating solution with the side of the wafer that is to be processed in a face down orientation during electroplating;

an anode disposed in the electroplating solution in the processing base.

4. An apparatus as claimed in claim 3 wherein the electroplating solution provides ions and/or complexes of platinum for electroplating the surface of the workpiece.

5. A contact member for use in conducting electroplating power to a surface of a microelectronic workpiece that is to be electroplated with a noble metal or noble metal alloy comprising:

a conductive member;

a removable conductive surface material disposed about an exterior surface of the conductive member.

6. A contact member as claimed in claim 5 wherein the removable conductive surface material is a removable conductive strip wound about the exterior surface of the conductive member.

7. A contact member as claimed in claim 5 wherein the conductive member and the removable conductive surface material form a single, discreet contact.

8. An apparatus for plating a noble metal on a microelectronic workpiece comprising:

a reactor chamber;

an electroplating solution containing ions and/or complexes of the noble metal that is to be plated onto the workpiece;

a workpiece support including a contact assembly for providing electroplating power to a surface at a side of the workpiece that is to be plated;

an anode spaced from the workpiece support within the reaction chamber and contacting the electroplating solution;

a chemical delivery system for supplying the electroplating solution to the reactor chamber and recirculating electroplating solution removed from the reactor chamber; and

a multi-stage filtration system disposed within the chemical delivery system for filtering electroplating solution removed from the reactor chamber before it is re-supplied to the reactor chamber, the multi-stage filtration system including at least a first filter stage for filtering particles greater than or equal to a first size and a second filter stage disposed downstream of the

first filter stage for filtering particles greater than or equal to a second size and wherein the first size is greater in magnitude than the second size.

9. An apparatus as claimed in claim 8 wherein the electroplating solution provides ions and/or complexes of platinum for electroplating the surface of the workpiece.

10. An apparatus as claimed in claim 8 wherein the first filter stage provides filtration of particles that are equal to or larger than about 4.5μm.

11. An apparatus as claimed in claim 10 wherein the second filter stage provides filtration of particles that are equal to or larger than about 0.1μm - 1.0μm.

12. An apparatus as claimed in claim 11 and further comprising a third filter stage for filtering particles that are equal to or larger than a third size, the third filter stage disposed downstream of the second filter stage, the third size being smaller in magnitude than the second size.

13. An apparatus as claimed in claim 12 wherein the third filter stage provides

filtration of particles equal to or larger than about 0.1μm.

14. An apparatus for plating a noble metal or noble metal alloy on a microelectronic workpiece comprising:

a reactor chamber;

an electroplating solution containing ions and/or complexes of the noble metal that is to be plated onto the workpiece;

a workpiece support including a contact assembly for providing electroplating power to the workpiece that is to be plated;

an anode spaced from the workpiece support within the reaction chamber and contacting the electroplating solution;

a disposable current thief disposed in the electroplating solution between the anode and the contact assembly, the disposable current thief comprising conductive portions of a printed circuit board.

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15. A method for electroplating a noble metal on a surface of a microelectronic workpiece, the method comprising the steps of:

bringing the surface of the workpiece that is to be plated into contact with an electroplating solution including ions and/or complexes of a noble metal that is to be plated on the surface of the workpiece;

providing an anode spaced from the surface of the workpiece support and contacting the electroplating solution.

applying electroplating power between the surface of the workpiece and the anode using a low current for a first predetermined period of time;

applying higher current electroplating power between the surface of the workpiece and the anode for a second predetermined period of time;

halting application of electroplating power; and

disengaging the surface of the workpiece from the electroplating solution.

16. A method as set forth in claim 15 and further comprising the step of pre-rinsing the surface of the workpiece prior to bringing it into contact with the electroplating solution.

17. A method as set forth in claim 16 wherein the surface of the workpiece that is to be plated is pre-rinsed using an acidic solution.

18. A method as set forth in claim 15 and further comprising the step of spinning the workpiece at a high spin rate to remove excess electroplating solution.

19. A method as set forth in claim 16 and further comprising the steps of:

rinsing the workpiece in a spray of deionized water for a predetermined period of time; and

spin drying the workpiece at a high rotation rate.

20. A method as claimed in claim 15 wherein the electroplating solution includes ions and/or complexes of platinum for deposition on the surface of the workpiece.

21. A method as claimed in claim 20 wherein the electroplating solution has a platinum concentration of about 10-15 g/l.

22. A method as claimed in claim 20 wherein the electroplating solution has an elevated temperature in a range between about 40 °C and 80 °C.

23. A method as claimed in claim 22 wherein the electroplating solution has an elevated temperature of about 65°C +/-5°C.

24. A method as claimed in claim 15 wherein the electroplating solution has a pH in a range of about 11-12.

25. A method as claimed in claim 24 wherein the initial low current is applied using a pulsed waveform.

26. A method as claimed in claim 25 wherein the higher current electroplating power has a current density between about 3 and 9 mA/cm^2.

27. A method as claimed in claim 20 wherein the electroplating solution has a pH in a range of about 2-4.

28. A method as claimed in claim 27 wherein the electroplating solution has a platinum concentration in a range of about 2-16 g/l.

29. A method as claimed in claim 28 wherein the higher current electroplating power has a current density between about 20-50 mA/cm^2 .

30. A method as claimed in claim 29 wherein the higher current electroplating power is applied using a pulsed waveform.

31. A method as claimed in claim 30 wherein the pulsed waveform comprises an on-time in a range of about 1-10 ms and an off-time in a range of about 1-10 ms.

32. A method as claimed in claim 15 and further comprising the step of subjecting the surface of the workpiece to a preliminary cleaning process.

33. A method as claimed in claim 32 wherein the preliminary cleaning process comprises the step of spraying deionized water onto the surface of the workpiece that is to be electroplated.

34. A method as claimed in claim 33 wherein the deionized water comprises at least one additive selected from the group consisting of an acid and surfactant.

35. An apparatus for plating a noble metal or noble metal alloy on a microelectronic workpiece comprising:

a reactor chamber;

an electroplating solution disposed in the reactor chamber, the electroplating solution containing ions or complexes of a noble metal that is to be plated onto the workpiece;

a workpiece support including a contact for providing electroplating power the workpiece, the workpiece support holding the workpiece so that the side of the workpiece that is to be electroplated is disposed in a face-down orientation for contact with the electroplating solution in the reactor chamber;

at least one anode spaced from the workpiece support within the reaction chamber and contacting the electroplating solution.

36. An apparatus as claimed in claim 35 wherein the electroplating solution provides platinum complexes or ions for electroplating the workpiece.

37. An apparatus as claimed in claim 36 wherein the reactor chamber comprises:

a principal fluid flow chamber providing a flow of electroplating solution to the surface of the workpiece;

a plurality of nozzles disposed to provide a flow of electroplating solution to the principal fluid flow chamber, the plurality of nozzles being arranged and directed to provide vertical, horizontal, and radial fluid flow components that combine to generate a substantially uniform normal flow component radially across the at least one surface of the workpiece.

38. An apparatus as claimed in claim 37 and further comprising an antechamber disposed in a flow path of the electroplating solution prior to the plurality of nozzles, the antechamber being dimensioned to assist in the removal of gaseous components entrained in the processing fluid.

39. An apparatus as claimed in claim 37 and further comprising a plenum disposed in the fluid flow path between the antechamber and the plurality of nozzles.

40. An apparatus as claimed in claim 38 wherein the antechamber comprises an inlet

portion and an outlet portion, the inlet portion having a smaller cross-section compared to the outlet portion.

41. An apparatus as claimed in claim 37 wherein at least some of the plurality of nozzles are in the form of horizontal slots.

42. An apparatus as claimed in claim 37 wherein the principal processing chamber is defined by one or more sidewalls, at least some of the plurality of nozzles being disposed through the one or more sidewalls.

43. An apparatus as claimed in claim 42 wherein the principal processing chamber comprises one or more contoured sidewalls at an upper portion thereof to inhibit fluid flow separation as the electroplating solution flows toward an upper portion of the principal processing chamber to contact the surface of the microelectronic workpiece.